THE VALUE OF ^{75}Se-SELENITE IN BRAIN SCANNING

The recent communication by De Roo (*1*) in which he reported a relatively high incidence of positive ^{75}Se-selenite brain scans in his series of patients with cerebrovascular disease warrants comment since his results and conclusions differ from those of others.

Following injection of ^{75}Se-selenite in humans, most of the ^{75}Se is firmly attached to plasma protein (*2*). Blood clearance is multiexponential, with a relatively rapid phase during the initial 2–4 days (*2,3*). It is not surprising, therefore, to find positive ^{75}Se scans in some patients with cerebral infarcts, particularly when the scans are done during the first 24 hr after dose administration (*4*). In our experience the abnormal ^{75}Se brain scan in many such cases tends to become normal with time (beyond 24 hr) following the administration of the agent. (In contrast, intracerebral tumors and abscesses become more apparent in scans done at later times after the dose.) All of De Roo's scans were performed at 24 hr after dose administration; ours were repeated at 48 and sometimes at 72 hr as well. The relatively high incidence of positive selenite scans in his cases of cerebrovascular accident (CVA) (9/16), compared with our findings reported previously (5/24 cases), might be due at least in part to the difference in the times at which the scans were performed. The incidence of positive pertechnetate scans was similar in the two series.

Dr. De Roo is correct in pointing out that no currently available radiopharmaceutical, including selenite, is truly specific for tumors. Selenite has been shown to be actively concentrated by normal leukocytes in vitro (*5*) as well as by tumors (*2*). Although the physical characteristics of ^{75}Se and the biologic $T_{1/2}$ of this agent are not particularly suited for the use of selenite as a routine scanning agent, selenite does show a high degree of selectivity for mass lesions, either neoplastic or inflammatory (*3*). The principal value of selenite in brain scanning is probably as a secondary agent for use in cases in which the differential diagnosis rests between a CVA and a mass lesion. The finding of a positive pertechnetate scan and a negative selenite scan is strong evidence against a tumor or abscess. This combination was found in three of De Roo's cases of CVA but apparently in none of his patients with tumor.

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THE AUTHOR'S REPLY

I acknowledge gratefully the comments of Dr. Cavalieri concerning my study on the value of ^{75}Se-selenite in brain scanning.

As suggested by Dr. Cavalieri, it is possible that, due to the fact that ^{75}Se-selenite clearance from the plasma is rather slow, the hypervascularization surrounding the infarcted zone is partly responsible for the high incidence of positive selenite scans in cerebrovascular disease as found in my study. The incidence of the hyperemia phase, however, in cerebral infarct with early-filling veins (as demonstrated by cerebral angiography) is rather low [14%, Huber (*1*), 14%, Lanner and Rosengren (*2*), 33%, Laroche and Cronqvist (*3*), 45%, Taveras, et al (*4*)]. Using ^{133}Xe cerebral blood flow measurements, Cronqvist (*5*) found only focal hyperemia in 19% of his cases.

In the majority of the patients with positive selenite scans, the hyperactive zone must be attributed to impregnation of the infarcted tissue probably by alteration of the blood brain barrier. Even using ^{67}Ga-citrate, Wallner, et al (*6*) found uptake in cerebral infarcts. Interference of hyperemia is excluded with this tracer substance because of low blood concentration values at the moment of the scintigraphic exploration.

Taking into account the previously given data, it can be assumed that the focal hyperemia is not solely